

What is Claimed is:

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5 1. A semiconductor laser device comprising:
a first semiconductor layer including an active layer;
a striped second semiconductor layer formed on said first semiconductor layer; and

a current blocking layer formed on said first semiconductor layer on both sides of said second semiconductor layer,

10 said second semiconductor layer including a cladding layer which comprises a lower layer having a first width at its lower end and an upper layer having a second width larger than said first width at its lower end and has a larger band-gap than that of said active layer.

15 2. The semiconductor laser device according to claim 1, wherein

said cladding layer has the function of confining light in said active layer.

20 3. The semiconductor laser device according to claim 1, further comprising

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25 a third semiconductor layer formed on said cladding layer and having a carrier concentration which is not less than that of said cladding layer.

4. The semiconductor laser device according to claim 3, wherein

said third semiconductor layer is a contact layer.

5 5. The semiconductor laser device according to claim 1, further comprising

a third semiconductor layer formed on said cladding layer and having a smaller band-gap than that of said cladding layer.

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6. The semiconductor laser device according to claim 5, wherein

said third semiconductor layer is a contact layer.

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7. The semiconductor laser device according to claim 1, wherein

said lower layer in said cladding layer has said first width which is approximately constant from its lower end to its upper end, and

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said upper layer in said cladding layer has a second width which is approximately constant from its lower end to its upper end.

8. The semiconductor laser device according to claim 25 1, wherein

said lower layer in said cladding layer has said first width which is approximately constant from its lower end to its upper end, and

said upper layer in said cladding layer has a width
5 which gradually decreases upward from said second width.

9. The semiconductor laser device according to claim 1, wherein

said first semiconductor layer comprises a cladding
10 layer of a first conductivity type, said active layer, and a first cladding layer of a second conductivity type in this order from its bottom, and

said second semiconductor layer comprises a second
cladding layer of a second conductivity type as said cladding
15 layer.

10. The semiconductor laser device according to claim 1, wherein

said first semiconductor layer is a first nitride
20 based semiconductor layer containing at least one of boron, thallium, gallium, aluminum, and indium,

said second semiconductor layer is a second nitride
based semiconductor layer containing at least one of boron, thallium, gallium, aluminum, and indium, and

25 said current blocking layer is a third nitride based

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semiconductor layer containing at least one of boron,
thallium, gallium, aluminum, and indium.

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5 11. A method of fabricating a semiconductor laser device, comprising the steps of:

forming a first semiconductor layer including an active layer; and

forming a striped second semiconductor layer on said first semiconductor layer, and forming a current blocking layer on said first semiconductor layer on both sides of said second semiconductor layer,

the step of forming said second semiconductor layer comprising the step of forming a cladding layer which comprises a lower layer having a first width at its lower end and an upper layer having a second width larger than said first width at its lower end and has a larger band-gap than that of said active layer.

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20 12. The method according to claim 11, wherein the step of forming said second semiconductor layer and said current blocking layer comprises the steps of forming a current blocking layer on said first semiconductor layer,

forming on said current blocking layer a first mask pattern having a first striped opening,

etching said current blocking layer inside said first striped opening of said first mask pattern by a first depth, to form a striped recess in said current blocking layer,

5 removing said first mask pattern, and then forming a second mask pattern having a second striped opening wider than said striped recess of said current blocking layer on said current blocking layer on both sides of said striped recess,

10 etching said current blocking layer inside said second striped opening of said second mask pattern to a second depth at which said first semiconductor layer is exposed, to form in said current blocking layer a striped opening which stepwise widens from a lower end to an upper end of said current blocking layer, and

15 removing said second mask pattern, and then forming said second semiconductor layer on said current blocking layer and on said first semiconductor layer inside said striped opening of said current blocking layer.

20 13. The method according to claim 11, wherein the step of forming said second semiconductor layer and said current blocking layer comprises the steps of forming a current blocking layer on said first semiconductor layer,

25 forming on said current blocking layer a first mask

pattern having a first striped opening and composed of a first material,

forming a second mask pattern having a second striped opening narrower than said first striped opening of said first mask pattern and composed of a second material different from said first material on said current blocking layer inside the first striped opening and on said first mask pattern,

etching said current blocking layer inside said second striped opening of said second mask pattern by a first depth, to form a striped recess in said current blocking layer,

removing said second mask pattern, and then etching said current blocking layer inside said first striped opening of said first mask pattern to a second depth at which said first semiconductor layer is exposed, to form in said current blocking layer a striped opening which stepwise widens from a lower end to an upper end of said current blocking layer, and

removing said first mask pattern, and then forming said second semiconductor layer on said current blocking layer and on said first semiconductor layer inside said striped opening of the current blocking layer.

14. The method according to claim 11, wherein the step of forming said second semiconductor layer

and said current blocking layer comprises the steps of

forming a first current blocking layer on said first semiconductor layer,

forming on said first current blocking layer a first
5 mask pattern having a first striped opening,

etching said current blocking layer inside said first striped opening of said first mask pattern, to form a striped opening in said first current blocking layer,

removing said first mask pattern, and then forming a
10 second semiconductor layer on said first current blocking layer and on said first semiconductor layer inside said striped opening of said first current blocking layer,

forming a striped second mask pattern in a region on
said second semiconductor layer above said striped opening
15 of said first current blocking layer,

etching said second semiconductor layer, except in a region of said second mask pattern to expose said first current blocking layer on both sides of said second mask pattern, to form in said second semiconductor layer a lower
20 layer having said first width which is approximately constant from its lower end to its upper end and an upper layer having a width which gradually decreases upward from said second width, and

selectively forming a second current blocking layer
25 on said first current blocking layer, except in a region on

said second mask pattern.

15. The method according to claim 11, wherein
the step of forming said second semiconductor layer
5 and said current blocking layer comprises the steps of
forming on said first semiconductor layer a first mask
pattern having a striped opening,

selectively growing a second semiconductor layer on
said first semiconductor layer inside said striped opening
10 and on said first mask pattern in the periphery of said
striped opening,

removing said first mask pattern, and then forming a
second mask pattern on an upper surface of said second
semiconductor layer, and

15 selectively growing a current blocking layer on said
first semiconductor layer on both sides of said second
semiconductor layer, except on said second mask pattern.

16. The method according to claim 11, further
20 comprising the step of
forming on said cladding layer a third semiconductor
layer having a smaller band-gap than that of said cladding
layer.

25 17. The method according to claim 11, further

comprising the step of

forming on said cladding layer a third semiconductor layer having a carrier concentration which is not less than that of said cladding layer.

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18. The method according to claim 11, wherein

the step of forming said cladding layer comprises the step of forming a lower layer having said first width which is approximately constant from its lower end to its upper end and an upper layer having said second width which is approximately constant from its lower end to its upper end.

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19. The method according to claim 11, wherein

the step of forming said cladding layer comprises the step of forming a lower layer having said first width which is approximately constant from its lower end to its upper end and an upper layer having a width which gradually decreases upward from said second width.

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20. The method according to claim 11, wherein

the step of forming said first semiconductor layer comprises the step of forming a cladding layer of a first conductivity type, said active layer, and a first cladding layer of a second conductivity type in this order from its bottom, and

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the step of forming said second semiconductor layer comprises the step of forming a second cladding layer of a second conductivity type as said cladding layer.

- 5 21. The method according to claim 11, wherein
said first semiconductor layer is a first nitride
based semiconductor layer containing at least one of boron,
thallium, gallium, aluminum, and indium,
said second semiconductor layer is a second nitride
10 based semiconductor layer containing at least one of boron,
thallium, gallium, aluminum, and indium, and
said current blocking layer is a third nitride based
semiconductor layer containing at least one of boron,
thallium, gallium, aluminum, and indium.